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An Occasional Paper

HEALTH AS A NATIONAL ASSET:

CAN THIS PERSPECTIVE FROM FINLAND HELP US REFORM OUR HEALTH SECTOR?

by
Phyllis Freeman, JD & Anthony Robbins, MD

October 2001

University of Massachusetts Boston

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TABLE OF CONTENTS

Executive Summary

It is now more than thirty years since a US President and health experts declared the nation's 'health system' to be in crisis—a crisis that has never abated. Opinion surveys show that Americans are less satisfied with our 'health system' than people in other industrial democracies are with theirs, yet the public tolerates what would be considered outrages in any other industrial democracy.

A study tour of Finland engaged the authors in a reassessment of the US approach to reform. The key observation is that Finland treats health as a national asset and health problems as challenges to communities and to all of society, not primarily as the private struggles of individual victims and their loved ones. Thus, society functions to protect and enhance health—by actions within the health sector and by integration of health and health activities, into policy for other sectors of the society as well.

Finland built its health sector during a rapid, post-World War II transformation from a poor, pre industrial society into a modern, fully industrial one. The authors explore three themes from the development of Finland's health sector—*systematic, inclusive,* and *equitable*—and how these characterize a national approach to health.

To illustrate how Finland has translated these fundamental principles into operation, the paper discusses three examples: cardiovascular disease, cancer, and occupational health. To tackle an epidemic of ischemic heart disease, Finns designed a novel, community-based approach as soon as new data revealed the gravity of the problem. They organized participation of an entire province, North Karelia, as a model area for testing a community intervention that subsequently benefited all of Finland (and many other parts of the world). The cancer story evolved more slowly, with data, particularly from registries, driving new efforts to understand causes and assess interventions, so that prevention, screening, and treatment would become optimally effective. The history of Finland's occupational health programs, probably the most intensive and extensive attention to the health of workers in the world, demonstrates how health policies have been integrated into other national policy, particularly for the economy.

Each example demonstrates the fundamental role of data and research; attention to protection and prevention; centrality of universal primary health care; supporting roles of specialists and non-medical services; and critical connections with other sectors of Finnish society. Each identifies results of which Finland should be proud, and the limitations and challenges that remain. Together the

examples illustrate the advantage Finland seems to enjoy for defining problems and for engaging popular support around new strategies to protect and improve health. This advantage was conferred, at least in part, by Finland's reliance on principles to guide uses of data, formulate questions for research, and direct program implementation.

The authors conclude, that although Finland cannot offer a model for the US, certain elements of their approach to building their health sector can provide guidance for future reforms here. There is little evidence that US political leaders conceive of health as a national asset or articulate its role as such. Perhaps those engaged in US health reform can propel rebuilding in two ways:

- Help those who aspire to be tomorrow's leaders, learn the potential value to American society of treating our population's health as an asset; and

- Identify and articulate a few operating principles to serve as guideposts for rebuilding our health sector.

With more thought reformers may identify operating principles uniquely appropriate to the US. Finland's experience suggests that principles will be crucial if the US is to move beyond the objective of evidence-based medicine to a national goal of evidence-based health.

Introduction

We remain amazed that the American public tolerates in our health sector what would be considered outrages in any other industrial democracy: millions are excluded from primary care while medical spending per capita exceeds that of any other nation; health inequalities grow and improvements in the population's health lag; 'returns on investment' rather than 'health outcomes' are the most common measures of health sector productivity; mistrust escalates among consumers, providers, insurers, and drug manufacturers; and failures to protect the public from avoidable illness and injury stimulate little criticism.

It is now more than thirty years since President Nixon and health experts first declared our 'health system' to be in crisis:

> The American health crisis became official in 1969. President Nixon announced it in a special message in July. Liberal academic observers of the health scene, from John Knowles to Einstein College of Medicine's Martin Cherkasky, hastened to verify the existence of the crisis. Now the media is rushing in with details and documentation. *Time*, *Fortune*, *Business Week*, CBS, and NBC are on the medical scene, and finding it "chaotic," "archaic," and "unimaginable."[1]

The crisis has never abated. As observers of the health sector, we always believed that pragmatic, incremental changes could add up to notable improvement in population health outcomes, reduction of inequalities, effective health protection, participation in medical care by the once excluded, and greater consumer satisfaction. Now we find successful sector-wide reform seems highly unlikely, particularly if we fail to apply certain lessons we learned, somewhat inadvertently, from our Finnish colleagues.

Today even prestigious advisors to our government assert that, "The entire US health system is creaky and unworkable and has to be completely overhauled to make it safe and efficient..."[2] In other words, to emerge from crisis and fix our 'health system,' the US will need to rebuild it.

Opinion surveys tell us that Americans are less satisfied with our 'health system' than people in other industrial democracies are with theirs. An impressive 35% of the US public is aware that we pay more than people in any other country.[3] What the US public understands about other countries' experiences is not clear, as Americans rarely consider how experience abroad may offer insight for improving our situation.[4]

We surprised ourselves as we learned just how useful the Finnish health sector experience might be. A study tour in Finland, a country of 'satisfied customers',[5] has sparked our interest in thinking anew about the US approach to reform. We are in no way tempted to argue that Finland can serve as our model. It is not comparable to the United States in size (5.1 million inhabitants) or diversity (nine of ten residents are of Finnish descent and speak Finnish as their first language). But months of reflection on what we saw in and read about Finland, and further consideration of its relevance for the United States, has provoked us to reconsider the US dilemma in ways we hope will engage and challenge others.

Our hosts were Jorma Rantanen, Director General of the Finnish Institute of Occupational Health, Liisa Elovainio, Director of the Finnish Cancer Society, Jaakko Tuomilehto, a professor at the National Public Health Institute specializing in the epidemiology of chronic diseases, and Gustav Wickstrom, Director of the regional Occupational Health Institute in Turku (southwest Finland). All of these health leaders came of age in post-World War II austerity, drawn to study social sciences as well as medicine. With clear memories of Finland before their homeland attained today's prosperity, their attention to improving the quality of life in Finland has been constant. Their habits of thought and speech reveal the extent to which they remain lifelong students of Finnish society, its economy, culture, and social institutions and how this informs their practice as health professionals.

Finland has enjoyed notable successes. People's health improved so dramatically since World War II, that Finland emerged as one of world's healthiest nations, healthier today in many ways than we.[6] Consumer satisfaction in Finland ranks second in all of Europe only to Denmark[7] and the percentage of GDP Finns devote to health has always been modest. (It has hovered around 7%, ranging from 5.7% in 1970 to 9.4% in 1993 at the time the economy shrank by 15%. Thus the 9.4% did not represent an increase in health spending.)[8] The thirty years of US 'health crisis' coincide with the period during which Finland developed from an impoverished and war depleted country, into a thriving industrial democracy.

We were intrigued to learn from our hosts, in a way we could never have gleaned from the literature alone, how Finland treats health as an asset and health problems as challenges to communities and to all of society (not primarily as the private struggles of individual victims and their loved ones). Although our colleagues are well published in the scientific literature, they have not had time, or perhaps inclination, to write the kind of reflections that so enriched our understanding of their experience.

The key observation is that if health is understood as a national asset, then society functions to protect and enhance it—by actions within the health sector

and by integration of health and health activities, into policy for other sectors of the society as well. In our visit to and study of Finland we focused primarily on activities within the health sector. There we observed what we have come to characterize as fundamental principles for translating the notion of health as an asset into health sector operations. The adjectives we have chosen—*systematic, inclusive,* and *equitable*—are our words, selected after reflecting back over published materials, informed by the ten intensive days of meetings and friendly debates in which we felt privileged to participate in 1999. Thus, we begin by defining how we use these three closely related and sometimes overlapping terms.

Systematic: We use the term 'systematic' to reflect a comprehensive and scientific approach to health. Comprehensive data, research, and scientific analysis portray the health status of Finland's population over time and form a foundation for policy and action. Community and societal strategies to prevent disease and injury flow as naturally from the analyses as do treatment regimens. Universal primary health care occupies the center of all health efforts, linking community-based, population strategies to individualized medical treatment. Non-medical services also support individuals and families in a coordinated manner: rehabilitation, education and retraining, social programs, and pensions. To prevent and ameliorate health problems, all these elements complement programs and policies of the broader society. Activities in the health sector are linked consciously to national policies on education, employment, and economic productivity. Enormous regard for health as a national asset is evident in every dimension of the systematic approach.

Inclusive: We use 'inclusive' to reflect the intention that when society provides services or benefits, everyone is not only eligible, but encouraged to use them. Universal primary care is essential to the citizens' sense of belonging to society and engenders cooperation of the healthy, ill, and disabled alike in population-wide data systems, as well as in research and health programs. Everyone is to be included in the activities that will help society and will help individuals maintain or improve health.

Equitable: We use this term to mean that all members of society are intended to enjoy comparable benefits from the health sector. Poorer and more affluent residents of the same town use the same specialty services at the same facilities for similar diseases, injuries, and disabilities, and receive the same protection from public health programs. When health outcomes are not comparable across groups, however defined (e.g. by income, gender or geography), concerted efforts are mounted to understand why, propose solutions, and incorporate these into public debate across the nation and within each municipality.

Built upon a long tradition of strong local democracy, Finland's central government created major redistributive programs and policies after World War II to increase equity among the 452 municipalities, often distributing its tax revenues to aid poorer communities. Two developments in the last decade have damped this tradition: 1) after 40 years of unbroken economic growth, a severe economic crisis in 1991 shrank the economy by 15%, leaving central government with diminished tax revenues to distribute; and, 2) municipal governments' negative reaction to rules and standards imposed from Helsinki added to the need to contain local expenditures. Parliament, in 1993, decided to permit greater local autonomy in many domains, including health.[9,10,11] Our colleagues believe that the pendulum will swing back. Policies to assure greater equity across municipalities and regions will regain support.

To illustrate how Finland has translated these fundamental principles into operation, we focus on three examples: cardiovascular disease, cancer, and occupational health. As others describe Finland's health sector in great detail[12,13,14] we concentrate only on these examples. They help us show how Finland relied on unifying themes, *systematic, inclusive,* and *equitable,* while building its health sector during its transformation into a modern, fully industrial society. Discussion of Finland's other defining social and economic policies exceed the scope of this paper.

To tackle an epidemic of ischemic heart disease, Finns designed a novel, community-based approach as soon as new data revealed the gravity of the problem. They organized participation of an entire province, North Karelia, as a model area for testing a community intervention that subsequently benefited all of Finland (and many other countries). The cancer story evolved more slowly, with data, particularly from registries, driving new efforts to understand causes and to assess interventions, so that prevention, screening, and treatment would become optimally effective. The history of Finland's occupational health programs, probably the most intensive and extensive attention to the health of workers in the world, demonstrates how health policies have been integrated into other national policy, particularly for the economy.

We organize each example to make apparent the fundamental role of data and research; attention to protection and prevention; centrality of universal primary health care; supporting roles of specialists and non-medical services; and critical connections with other sectors of Finnish society. In each we comment on results of which Finland should be proud, and the limitations and challenges that remain. We consider the advantage Finland seems to enjoy for defining problems and engaging popular support for new strategies to protect and improve health. This advantage was conferred, at least in part, by their reliance on principles to guide uses of data, formulate questions for research, and direct program implementation.

Cardiovascular Disease and the North Karelia Project

Early History & Data

Cardiologists and chronic disease specialists, including Americans, have carefully studied the results of the North Karelia Project (NKP). The project, in the eastern Finnish province bordering the Russian Federation's region of Karelia, is widely believed to be responsible for a remarkable decline in ischemic heart disease mortality in Finland since 1970. Jaakko Tuomilehto, our host at the Finnish National Public Health Institute (NPHI) noted that few of the interested international experts who have studied the results of the NKP inquire about the thinking behind the results displayed in impressive tables and charts. He began his career as a medical student member of the planning team in 1970 and willingly related to us aspects of the historic and social context to illuminate the ample scientific literature. His commentary balanced observations about this extraordinary success with a critique about ways in which Finland has not heeded some of its lessons.

A particularly hard frost in the winter of 1867-68 ruined crops, causing famine. Desperate farm families ate their dairy cows, then had no source of milk or meat. Some survived by moving to the Arctic Ocean in Norway to fish and work. To avoid future famine, surviving and returning farmers greatly expanded dairy herds and meat production starting in the 1870s. This was the start of the national farming policy of self-sufficiency based on small dairy farms. Self-sufficnecy was implemented efficiently, and by World War II, one consequence was domination of meat and milk products in local diets, particularly in North Karelia. Even vigorous men conditioned to physical exertion by the war, farming and timbering died of heart attacks well before retirement. In the early 1970s, approximately 1000 myocardial infarctions occurred annually in the North Karelia population of 180,000, about half in men under 65 years and about 40% were fatal. By 1972, of 45-59 year-old men and women, 27% received disability pensions and about one third of those were due to cardiovascular disease.[15]

Although mortality data showed that heart disease deaths had been particularly common since the 19th century[16,17,18,19] before the 1970s only a few people had understood that the astonishing death rates in Finland were in fact the highest in the world.[20,21] Concerted efforts to understand the origins of the epidemic were already underway by the 1950s, based on disability pensions trends and on a new epidemiologic approach that targeted chronic diseases for the first time.[22] Building on an hypothesis of Ancel Keys, an academic researcher from Minnesota, that dairy fat caused high cholesterol, atherosclerosis, and the clinical

manifestations of ischemic heart disease,[23] a Finn, Dr. Martti Karvonen, helped initiate a series of longitudinal studies of physically active men, part of the Seven Countries Study, in which coronary heart disease incidence and mortality have been monitored since the late 1950s .[24,25,26,27,28]

The Regional Governor of North Karelia formed an advocacy group including the region's members of the national Parliament from all parties, and representatives of local government and voluntary organizations. In January 1971 they carried a petition to Helsinki, requesting that the government and voluntary health groups "should urgently undertake efficient action to plan and implement a program that would reduce this greatest public health problem of the province."[29,30] In response the Finnish Heart Association convened a working group. As Tuomilehto explained, the planners briefly considered a randomized controlled trial of multiple risk factors. But as individual risk factors seemed closely linked to community lifestyles, they looked for ways to intervene broadly, not to leave control groups outside the reach of potential benefit of the experimental interventions.[31,32]

Emboldened by the enormity and immediacy of the problem, NKP planners asked international experts what they thought of calling upon all North Karelians to participate in community efforts to lower *risk factor levels* regardless of any one person's level of risk. That would mean targeting diet and smoking through community efforts to change everyone's habits. The NKP design did include a neighboring province, Kuopio, as a reference area for comparing population effects.[33] Tuomilehto paraphrased for us his memory of the exchange. As these advisors were principally clinicians, and because prevention strategies for chronic diseases were in their infancy worldwide, the international panel responded by saying "You try it and then tell us." A few years later, after more experience with their community approach and further impetus from Geoffrey Rose's work with Framingham data,[34] the NKP team was able to formulate a clearer research question that might be answered with their data: Could risk factors be modified in whole populations, and if so, would this reduce coronary heart disease in those populations?[35,36,37,38,39]

Protection & Prevention

NKP planners settled on three targets—diet, smoking, and hypertension—all of which, separately and in combination, were supported by the scientific evidence.[40,41,42,43,44] As they viewed dietary and smoking patterns as determined largely by social and environmental factors,[45,46,47] they planned to influence behaviors and lifestyles through community strategies. (Common lifestyle

problems such as physical inactivity and obesity were not present in the North Karelian population at that time.) Their definition of the problem—one afflicting the entire society—drove the strategy. It seemed implausible for individuals to effect long lasting alterations in behavior if their social and physical environments did not change to support them. They could not promise any individual that participation would protect him or her from coronary artery disease and early death, but they concluded that little population improvement would result without population-wide changes:

> Although an individual's risk of CHD increases with increasing risk factor levels (a fact of obvious relevance for clinical practice), it is critical to realize that high risk individuals produce only a small proportion of the disease cases that occur in the community. Many cases arise among people with only moderate elevations, but usually in several risk factors simultaneously. Because the people with moderate risk outnumber the few really high risk individuals, and because the simultaneous occurrence of several risk factors has a synergistic impact, major reduction in the number of disease cases in the community can occur only if the general risk factor levels can be modified in this great majority—in practice, the whole population.[48]

Tuomilehto told us that getting started was difficult. Finnish (and non-Finnish) cardiologists were skeptical of the population approach.[49] The province's first response to the heart attack problem, probably influenced by the cardiologists, had been to build a modern hospital in 1952. North Karelia was the least developed of Finland's provinces and limited in virtually every kind of service.[50] In 1971, university researchers still favored the classical approach of randomized trials over a comprehensive community intervention strategy.[51] Social Democrats who at the national level controlled Parliament were initially unenthusiastic about a program championed by people close to the traditional farmers' party of North Karelia. To move the program forward, NKP resorted to local organizing, not something that medical student Tuomilehto ever envisioned as a physician's role. Tuomilehto noted that the NKP team set out with hope, but without confidence that their unusual approach would work. Staff visited regularly each town for day-long meetings with community leaders and local health center staff to determine which community risk reduction activities could reasonably be undertaken and who among local leaders would assume which responsibilities.

In 1971, small farmers grew few vegetables except potatoes. North Karelian men in the large timber industry workforce ate only what they could carry into the forests for weeks at a time—dairy products, salted meats, pork fat, and bread containing both salt and fat. Salting was the primary way of preserving food as rrefrigerators and freezers had been uncommon in Finland as in many other

countries. Dairy products, including cheese spreads, butter, whole milk yogurt, and whole liquid milk comprised about 40% of caloric intake in the region[52] and up to 60-70% for lumberjacks in eastern Finland according to Tuomilehto. He explained that dairies had never supplied retailers with reduced fat items; and that consumers had never requested them, probably as such products were not well known by the local people at that time. With postal survey results indicating that half of North Karelians were ready to buy reduced fat alternatives, NKP field staff cajoled dairies and retailers until they brought reduced fat products to market.

Collaboration with industries to reduce saturated fats and salt in all food groups and to increase vegetable consumption at home, and in school and workplace cafeterias, remained a central component of the strategy.[53] Women's groups advocated changes in home-prepared meals and encouraged kitchen gardens. In 1977, the results of the first five years were so positive in terms of behavior change and disability pension trends[54] that many of the activities were introduced into the reference province of Kuopio, and then beyond.[55,56] A substantial number of dairy farmers—whose herds came to be perceived as surplus—converted from cows to farm berries and fish.[57,58] All these efforts ended primary reliance on milk fat. The NKP employed similar community prevention strategies to control smoking.[59,60,61,62,63] At present, there is a working collaboration between the health sector and food industry in Finland, both sectors being committed to a further reduction of cardiovascular disease to the level in southern European countries.

Medical Care & Non-medical Services

The NKP team thought it vital to involve physicians, as Finns might regard all aspects of the NKP program less enthusiastically had their doctors not reinforced its importance. The third target, hypertension, provided a role in the NKP for physicians—historically respected community leaders—who might otherwise have seemed peripheral to the program.[64] Hypertension treatment had recently proven effective[65,66] and its place among the three targets was further reinforced by the availability of full reimbursement for treatment through the Social Insurance Institution, Finland's national health insurance.

National Health and Social Insurance was enacted in Finland in 1963; it paid for many doctors' consultations, but until Finnish health legislation mandated a shift in priorities, none of the NKP goals could have been realized. The National Primary Care Health Act of 1972 shifted near total reliance on hospitals and their specialists for sick care to emphasize primary care and prevention—and to make

it universal. Finland built from scratch a public system of municipally operated health centers, 250 by 1995.[67] Primary health care centers either offered or arranged a full range of services, medical attention along with rehabilitation, social services, and disability pensions,[68] referring sicker patients to a tiered system of hospitals and university medical facilities. Finland's medical care is regionalized. Municipalities which had, since the 19th century, assumed the responsibility to provide social and medical services, created federations to share hospital services and costs.[69],[70] Those who suffered from heart attacks in North Karelia were assured acute care in their regional hospitals.

A lower birthrate due to the enhanced birth control programs and to the out-migration of young people from eastern Finland meant that midwives and public health nurses were less in demand. As they moved into roles as public health nurses in the new municipal health centers, NKP engaged them as the principal protagonists in community prevention efforts. As part of their regular health center responsibilities, they organized field programs on diet and smoking. In addition to their community roles, they assured that the entire local population was screened for hypertension. They maintained a registry that allowed for detailed follow-up and analysis of treatment results of hypertension.[71] These nurses provided the key organizational link between community interventions, primary care, and physician referrals into specialized medical care.

Outcomes, Results, & Challenges

The population outcomes impressed observers around the world. Within a few years, the rest of Finland adopted similar strategies. Since the people working for the NKP also actively participated in the development of the national strategy, it is not surprising that Finland's policymakers were able to appreciate the benefits of preventing cardiovascular disease. The Finnish government was interested in reducing expenditures due to the high prevalence of cardiovascular disease in part because tax revenues paid, in ways that could be easily tracked, for many of the costs: primary care, specialist services, tertiary care, rehabilitation, and disability insurance. Ischemic heart disease mortality declined by 57% in North Karelia and 52% in all of Finland from 1969-71 to 1992, according to internationally scrutinized data.[72] In twenty years, cardiovascular disease had slipped from first place as the cause of disability retirements in all of Finland to third, after musculoskeletal and mental disorders.[73] The rate of cardiovascular disease disability retirements continued to decline even as all other causes of retirement increased after 1985.[74]

Jaakko Tuomilehto commented that Finland has not uniformly applied the lessons from this remarkable success in improving population health—or gained comparable results where they have made considerable efforts. Even as adult smoking diminished, teen use of tobacco has increased despite intensive anti-smoking programs geared to this population.[75] Another challenge particular to Finland, a high suicide rate linked to depression and binge drinking, especially in males, persists (even though rates of alcohol consumption are not generally high).[76] Increasingly sedentary lifestyles have also resulted in more obesity and type 2 diabetes.

Although Finnish public health experts were early to grasp what Rose later explained to the world in his classic 1992 text on community prevention,[77] day to day, the demands for personal medical care in Finland dominate both programs and planning. Especially since the economic crisis of 1991 and the change from federal subsidies earmarked for health to a program of municipal block grants in 1993, attention to community prevention has slipped.[78] Local politicians choose to allocate fewer resources to prevention as it now competes directly with education, medical care, and social services. With fewer staff in health clinics[79,80] and new policies to reduce waiting times for medical attention and enhance continuity of care by assigning personal physicians,[81] staff for targeted community action have been scarce.

Nevertheless, when public debates erupt about health problems, the successes we observed in the extensively documented NKP serve to remind Finns that certain principles and organized approaches to their problems have worked before and can be revisited for guidance in the face of new challenges.

Cancer

Smoking & Cancer

The other great success of the first 20 years of the NKP was a rapid decline in cancer deaths among middle-aged men. NKP attributed the steeper decline in their province in the 1980s largely to reduced cigarette smoking.[82] North Karelians had smoked more and their smoking declined more rapidly than in the rest of Finland, but the success combating cancer is a nationwide story.

As explained to us by Dr. Liisa Elovainio, the Executive Director of the Cancer Society, Finns acquired their heavy smoking habits from the Russians in the 1800s. Even before 1940, radiologists and oncologists began to notice numerous cancers in smokers. Early research, often published in the US, helped them associate cause and effect. But the war delayed an organized response—and exacerbated the problem. When Finnish generals could not provide sufficient food for the troops, they offered cigarettes to quell hunger pangs. At the end of World War II, about 75% of men and 13% of women smoked.[83],[84]

By 1946 physicians in Finland (including Dr. Elovainio's father, a lung specialist) began to warn publicly about cigarettes and cancer. Statistics on lung cancer began to appear in the 1950s[85] and the US Surgeon General's report of 1962 was viewed as a landmark in Finland. The national cancer registry, established by the Cancer Society, helped link tobacco use to cancer incidence and mortality. Finland passed legislation to limit tobacco use in 1977, earlier than anywhere else in Europe except for Norway (1975) and initiated community efforts. Finland was first in Europe to file a law suit against any tobacco manufacturer. Health professionals engaged the media in waging highly visible anti-smoking campaigns; legal measures included prohibition against advertising of any tobacco products. Age adjusted lung cancer incidence, which has been studied since 1953, peaked in 1972 at 80/100,000 for males and then declined to fewer than 40/100,000 in 1997.[86] Over the same period, Elovainio explained, female rates rose from slightly more than 5/100,000 to 9.1/100,000. Reduction of tobacco use remains a major focus of cancer prevention in Finland.

Reliance on Data, Registries, & Research

Finland's cancer programs employ comprehensive data collection, research, and analysis to guide prevention, screening for early detection, treatment, rehabilitation, and social support for patients and families. Registry data are vital for predicting future rates, identifying avoidable cancers, and for improving

prevention and treatment strategies including public and professional education.[87] Dr. Elovainio emphasized how much Finland's cancer programs depend on cooperation from everyone to improve disease prevention while advancing treatment of individuals. Along with tobacco control, Finland's cancer registry and screening programs have played integral roles in transforming cancer from a problem for individual patients into a collective one, emphasizing prevention.

Dr. Elovainio explained that *incidence registration* is a key ingredient in gaining cooperation of all members of society for research to support both prevention and treatment. While countries without registries focus on mortality data, Finland's has won greater public responsiveness by emphasizing incidence registration—listing each newly discovered cancer in the registry. The full range of health organizations and professionals regularly provide data to the registry[88],[89] and value the information that results from the collaboration.

Universal cooperation of patients and of health professionals in supplying data and participating in research provides a scientific foundation for all aspects of cancer prevention and care. Relying on already accepted legal and ethical standards for data management, which forbid commercial uses, Finland's health professionals search out new possibilities for combining data solely for the purpose of improving health. Throughout collection, coding, and electronic storage, data quality is carefully monitored.[90] By international standards data quality is very high. Neither Elovainio nor anyone else we queried could recall a hint of scandal involving health data handling by professionals or researchers—or anyone else.

Finland's Cancer Society, a voluntary organization founded in 1936, established the Cancer Registry and has operated it since its inception in 1952. Legislation had granted a national agency the right to collect cancer data and to maintain the registry containing personally identified data. By 1999, approximately 700,000 individual cancer patients had been registered. In addition to publishing annual statistics on occurrence and deaths, the Cancer Registry sponsors statistical and epidemiological analyses.[91],[92] Geo-coding provides coordinates for all residences to a resolution of 10 meters so that researchers can construct ad hoc areas and populations without reference to administrative borders. Researchers can associate environmental exposures with incident cases and search for clues to causes and for prevention.[93] They can study other suspected risk factors and compare populations (urban v. rural; poorer v. more affluent; north v. south). The comprehensive cancer registry provides a basis for making better projections than most countries in the world. These predictions allow Finland to assess the impact of existing prevention and treatment strategies and to identify emergence of new risk factors that may require revised measures.[94]

Finland maintains one of only seven full-country cancer registries in the world (along with Denmark, Iceland, Norway, Sweden, Canada and the UK).[95,96,97,98] Linking data has made larger studies possible. Cancer registry data have been linked with databases at the Finnish Institute of Occupational Health (FIOH), the National Institute of Public Health (NIPH), the Centre for Radiation and Nuclear Safety, the Social Insurance Institute, several university departments, cancer registries in other Nordic countries, Estonia, the US National Cancer Institute, and the International Agency for Research on Cancer.[99] The five Nordic countries have been sharing and comparing data for many years. They regularly publish estimates of avoidable cancers—"avoidable" if specific carcinogenic exposures were eliminated—and of population attributable risk. For example, if H. pylori infections were eliminated, they estimate that 58% of stomach cancers in Finland might never develop.[100]

Screening for Early Cancer Detection

Universal cancer screening programs, a carefully organized effort to limit the burden of disease, offer another example of collaboration among patients, doctors, municipalities, federal health authorities, and researchers. As Elovainio explained, shortly after some Finnish doctors met Dr. Papaniclaou in the 1940s and learned of his use of cervical cytology for secondary prevention of cervical cancer, they returned home from the US and set up the world's first pilot screening projects—soon to be followed by the world's first universal and free screening program. By the 1960s, the Cancer Society had helped every municipality establish universal cervical cancer screening for women aged 25-50. The Cancer Society was pushing for inclusivity and prevention long before 1972 when Finland enacted its universal system of primary health care.

The Cancer Society aggressively pursues its systematic tradition, evaluating every screening opportunity for population health benefits while considering the most effective and efficient means of integrating screening and primary care resources. To date, recommendation for universal screening covers cervical and breast cancers. Cervical cancer rates have declined rapidly.[101] Elovainio reports that recent registry data show breast cancer incidence remains higher than mortality, helping to focus new attention on prevention. The Cancer Society is studying whether to adopt universal screening recommendations for papiloma virus, melanoma, prostate, ovarian, and colorectal cancers.

The Cancer Society works with municipalities to advocate and facilitate expanded screening, such as lowering the age for regular Pap smears. Despite

increasing local control of health matters, all municipalities are still obliged to provide universal screening. Poorer municipalities, however, tend to limit the age range of universal cancer screening programs in order to stay within their tight budgets. Austerity measures inclined municipalities to use the increased autonomy granted by Parliament in 1993 to introduce user fees for some public primary care services.[102] Cancer screening, however, continues to be free to all in the targeted populations.

Treatment Programs & Planning

As soon as any cancer is detected, the patient enters into Finland's regionalized system of medical care. Regardless of differences in personal wealth, each municipality affords all its residents the same care from the same providers and facilities, including the most sophisticated specialty services in each of 22 hospital districts, spanning the 12 provinces (including one autonomous region).[103] The largely public medical system is designed to promote early, comprehensive, and equitable treatment for all members of society.[104] For participating in screening programs, the registry, and research, everyone expects to be part of the universal primary care programs and, from there, to be referred into the full array of specialty services—as needed—without risking discrimination in availability or quality of care. Even though a small percentage of Finns, mostly urban dwellers, purchase some of their outpatient services privately,* virtually all rely on hospital care through the public system.[105]

In addition to concentrating on equitable treatment for every cancer patient, Finland uses cancer registry data to manage allocation of medical resources.[106] Incidence data in and among the 22 districts reveal trends that national and regional planners and municipalities use to project service needs. Data on geographical distribution of risk factors, incidence, staging, and survival are used to evaluate the effectiveness of treatment regimes.[107]

Even as reduced smoking has diminished the number of lung cancers expected in men, registry data showed that lung cancer would still consume the largest portion of resources related to hospital stays. Similarly, projections have helped Finland's medical care system prepare for substantial increases in melanomas, prostate and breast cancers, with persistent geographic differences. Planners have used registry data to argue for longer hospital stays for older patients, who

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* Private services, mainly specialists, are available in after hours consultations in southern cities. Only 8% of physicians practice exclusively in the private sector. Municipalities can elect to purchase specialty services from public facilities, non or for profit private providers. Few such services exist in the sparsely settled northern and eastern parts of Finland.

have a higher risk of therapeutic complications, slower responses to rehabilitation, and greater need for social support.[108] Reliable population data inform municipalities, regions, NGOs, and central government agencies that collaborate to assure that service needs are met, including allocation of the relatively costly specialized services.

Results, Outcomes, & Challenges

Results from registry data show that in the 1950s Finnish men had much higher cancer mortality than in the other Nordic countries. After 1958, Finnish mortality rates decreased more rapidly and in the five years from 1983 to 1987, Finnish rates were already close to those of the other Nordics countries. The cancer mortality rates for women were also higher in Finland in the early years, but since 1970 have approached those in the comparison countries, as have mortality rates from all causes.[109] Finland's largest reductions in mortality are attributable to lower incidence of smoking-related cancers: lung, larynx, lip, and bladder.[110]

As elsewhere, outcomes in Finland differ by socioeconomic status. Recently, the registry has been used to study risk differentials among social classes and occupational groups[111] and to spot social inequalities in care. Survival rates vary by social class,[112] place of residence, and treatment (as well as by age, stage, anatomical site, and histology).[113] Finland's first population-based study of survival rates of patients by occupation surprised investigators by revealing that social class survival rate differences were at least as large and as common among women as among men,[114] despite their lower rates of workforce participation and occupational exposures.

Finnish authors fault their data for several omissions. So far the data represent "a one-sided view of cancer as a disease in need of medical treatment"[115] without proper representation of functional capacity, quality of life, and social well-being, including data to show how many are unable to work because of cancer. Nor do the data provide adequate information on control of pain or terminal care to evaluate these elements of cancer management.[116]

To promote prevention of occupational and environmental threats and increase the likelihood of identifying other risk factors,[117] researchers and health planners are enthusiastic about study possibilities, using linked data. Broad popular support appears assured. The health leaders we met could not imagine fulfilling their roles responsibly without population-wide incidence and mortality data for assessing the threats to public health and for improving prevention and treatment. As cancer patterns evolve, the Finns are among the world's most

prepared to cope effectively. The trust engendered by their clarity of purpose to benefit everyone's prospects for good health through data collection, research, prevention and care provides an enviable point of departure for new public debate surrounding cancer—or other threats to health.

Worker Health

Early History

Finland's attention to workers and the work environment is extraordinary. How and why did Finland come to make such a large investment in worker health and to what effect? The answer is complex, but it can best be pursued within the context of Finland's post-World War II reconstruction and development into a modern state. [118]

In the 1940s, an impoverished and still largely agricultural Finland managed to feed its people while exporting wood products and paper. Forestry dominated as the top revenue producing industry and timbering was extremely dangerous. Strong labor unions wanted their members cared for and protected. They demanded medical attention for workers in dangerous industries. Also employers recognized the importance of occupational health and safety as the country suffered from a severe shortage of workers. As Dr. Jorma Rantanen, the director of the Finnish Institute of Occupational Health (FIOH) for over twenty years tells it, the introduction of physicians into those workplaces helped Finland identify and understand occupational health hazards. The physicians and *social partners*—a term used by Finns meaning traditional labor market parties of the Nordic countries, government, central trade unions, and central employers federations—readily observed that workers could be protected and many diseases and injuries prevented. Finland made a commitment to do so.

Data & Worker Protection

Although curative services came first, by the 1950s Finland had turned its attention to identification and elimination of work-related risks and hazards.[119] In 1945, Finland created the research institute that Rantanen now heads, and invested in disease surveillance, hazard or environmental surveillance, and studies of control technologies.[120] By the late 1970s, FIOH was comparable in size to the United States' National Institute for Occupational Safety and Health

(NIOSH), which was serving a country forty times larger.* Finland organized its resources by concentrating research and expert functions in one governmental institution instead of scattering them in various organizations as has been done elsewhere.

Finland approached occupational health systematically, where, as in other Nordic countries, unions joined the two other *labor market parties*—employers and government—to set conditions of work. Standards were set and enforced. Systems of notification and many data sources, including additional registries, provided information to FIOH about industrial injuries, occupational cancers, occupational diseases, as well as environmental statistics on exposure to asbestos, chemicals, and physical agents like noise, vibration, and radiation. As the economy industrialized and expanded rapidly, largely because of growing trade with the Soviet Union, labor unions and the government insisted that employers eliminate serious risks. Finland's tradition of comprehensive data collection and of transparency, including the workers' right to know, is fundamental to these arrangements. (Registries include The Finnish Cancer Registry, the Hospital Discharge Registry with data on diseases and injuries leading to hospitalization; the Ministry of Labour publishes statistics on industrial accidents and injuries from data collected by the Federation of Accident Insurance Companies; Occupational diseases are notified by physicians to insurance companies and labor safety authorities which forward the notifications to FIOH).[121]

Occupational Health Services: attracting men into medical care

As Dr. Rantanen taught us, protection of healthy workers and avoidance of injury and disease predated establishment of specialized programs of preventive health services for workers. In the period from 1976-79, the leaders of unions attached new importance to occupational health *services*, partly because employers and the government, reflecting anti-inflationary national economic policy, were reluctant to grant wage increases. Parliament enacted an Occupational Health Care Act mandating employers to provide, starting in 1979, *preventive* occupational health services for all employees.[122] Finland then created the most ambitious and comprehensive worker health services program in the world. The Finnish Institute of Occupational Health responded by training more professionals for occupational health services.

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*One of us, Robbins, learned this upon first visiting FIOH in 1979 when serving as Director of the US National Institute for Occupational Safety and Health (NIOSH).

Large companies often had in-plant clinics and employed occupational health staff directly. Others established associations to operate occupational health care centers for several companies.[123] But the largest number of workers, most of those employed in small firms, were served from 1979 on by occupational health units co-located or integrated with the municipal primary health care centers that were established by the primary health care legislation of 1972. To meet their obligations, employers could rely on municipal providers or contract with private ones.

Expanding occupational health services had a secondary goal: to bring working age men into the medical care system. By the 1940s, Finland had already established a tradition of inviting all expectant mothers for check ups and promoting maternal and child health services.[124] Elovainio suggested this might be the first example of a preventive and inclusive orientation in the incremental development of Finland's health services. Then, from 1972, the national system of publicly financed and municipally organized health centers had consciously and dramatically expanded care, attracting mostly women and children. But as the architects of Occupational Health Services foresaw, it was the association of health care with work that would finally draw Finnish men into primary care. To this end, the Occupational Health Care Act always permitted employers to provide curative services along with the mandated preventive ones, paid for in part by employers and Social Security contributions of salaried workers.[125] By 1992, 82% of salaried workers could use occupational health providers for at least some of their treatment needs[126] and all were simultaneously enrolled in the universal system of care offered by municipal primary care programs and associated specialists and hospitals.[127]

The preventive focus of occupational health services afforded FIOH doctors a way to engage with firms over design of plants, processes, and equipment to protect workers' health. Dr. Rantanen recalled for us his routine response to municipal health center directors who frequently complained that the occupational health physicians were not regular doctors as "they are always walking out of the health centers to go the factories." He would carefully explain that seeing the workplace permitted physicians to prevent injuries and disease as well as to treat patients. In their preventive activities, occupational physicians they were supported in their understanding of the work environment by research and statistics from FIOH.

By 1992 occupational health services covered 1.6 million or 90% of wage earners (82% for some curative services as well). Another 45,000 farmers and 5000 entrepreneurs used these services voluntarily. The country deployed 1600 occupational health physicians (many of them part-time), 2000 occupational health nurses, 400 physiotherapists, 130 psychologists, and 800 auxiliary staff in

more than 1000 occupational health units. More than half of these professionals received specialized training from FIOH and its regional institutes.[128] By then the main types of occupational problems reported were musculoskeletal diseases, noise induced hearing loss, asbestos diseases, dermatoses, and allergic diseases of the respiratory tract[129] reflecting a workforce increasingly in service industries.

By participating in international activities in most parts of the world, FIOH purposefully accumulated knowledge about what risks and exposures to look for in the workplace and how to correct them.[130] Finland's researchers were able to study ever larger populations thanks to especially close collaboration with the four other Nordic countries.[131] By the time Finland faced its greatest societal challenge since World War II, their considerable injury and disease prevention efforts had matured into a true system, linking health professionals, workers and their unions, employers, and the government.

Economic Crisis & 'Work Ability'

In 1991 the collapse of the Russian and Eastern European economies devastated Finland's. From 1991-93, Finnish unemployment bulged to 20% (33% for workers under 25) from 3.5%.[132],[133] After the many years of growth, output and tax revenues declined, and demands on Finland's government social welfare programs—unemployment, disability, and retirement—swelled. Although the standard age for full-pension retirement remained 65, the average age at which Finns retired from the workforce dropped below 59.[134] Because early retirement with pension was not available until age 60, the only options for those out of work under age 60 were unemployment insurance or disability retirement for those unable to perform. An occupational health physician's assessment that a worker could no longer function adequately in *the* job which he or she had been doing amounted to qualification for disability retirement. (In the US, the Social Security standard for disability is the inability to do *any* job anywhere in the country.) Musculoskeletal, cardiovascular, and mental disorders were the most common causes of disability retirement.[135],[136] Today in Finland the occupational physician's assessment is more frequently rejected by the insurance system (the ultimate decisionmaker) than it was at the time of the economic crisis.

The FIOH responded early to the new economic environment, shifting from traditional research on occupational exposures to study how the health of workers from age 45 on affects capacity to work. Cognitive and physical aspects of aging, causes of lost productivity, workers who took sick leave, early retirement, and programs of rehabilitation became targets of intense study.[137]

Researchers and health programs simultaneously attempted to restore the work ability of older workers and to study the significant health-related vulnerabilities of the unemployed and prematurely retired.[138]

As part of a national effort to cope with the enormous change, Finland's traditional "social partners" made a collective agreement and government drafted amendments to the Occupational Health Care Act in 1994 with new emphasis on *work ability*.[139] In 1999, only 20% of those aged 60-64 remained employed. Although 60% of those aged 55-59 still take part in working life to some extent, unemployment among this cohort exceeds that of all other age groups in volume and duration (16% in 1999).[140] Young workers proved far more resilient as the worst of the crisis passed, reentering the workforce in larger numbers.[141]

Rantanen explained that the Finnish government has viewed programs to improve work ability through occupational health services as a key to long-term growth of the economy. As policy makers came to view experienced workers as an underutilized economic asset, efforts to maintain work ability concentrated on the nature of work and the workplace, not just the worker. The study of ergonomics to reduce both stress and strains gained importance. FIOH researchers asked, how could work be restructured to rely more on know-how and less on physical abilities?[142] How could information technology be used to reduce further the number of physically stressful work tasks?[143]

Outcomes, Results, & Challenges

While many industrial nations are still trying to eliminate dangerous exposures to silica, lead and asbestos, it is a measure of Finland's success with occupational disease, that most newly reported cases fall into four categories: repetitive strain injuries; hearing loss; skin diseases; and allergic respiratory disease.[144] All continue to decline. A 1990-92 FIOH screening campaign to find asbestos-induced disease resulted in a short-lived increase of reported cases, confirming that earlier efforts had already eliminated most exposure.[145] Scientific questions associated with newly discovered occupational illnesses, such as repetitive strain injuries[146] and indoor air pollution[147] are difficult to pin down, dissect, and remedy. Finland's occupational health research and services now concern all health problems influencing work ability, whether or not occupational in origin.

Worker health services have had their greatest impact in larger firms. The challenge grows in complexity as 95% of employers have fewer than ten employees and 99% have fewer than 50.[148] In the new economy dominated by

small businesses, occupational health units must monitor more workplaces and diagnose a greater range of ailments. Today, workers report and researchers investigate a new set of epidemics, including asthma,[149] the causes of which are more elusive than those from the era of timbering and basic manufacturing.

Because national health resources are tight, critics within Finland suggest that parallel systems of care—under the National Primary Care Act and the Occupational Health Care Act, and the interaction of the two with Social Security Sickness Insurance—now cause competition for scarce resources and foster inequities. To include working age men in medical care, the original Occupational Health Care Act encouraged subsidies of medical care by employers to provide workers services not equally available to children and others relying on the parallel primary care system—more often women than men. (Finland still has what many believe to be an unacceptably high mortality rate among middle aged men.) This situation was compounded by imposition of user fees by municipal health centers, further burdening equitable distribution of medical services, especially ambulatory care.

These decisions and solutions seem well understood and much under discussion in Finland today. They were pragmatic responses to issues confronted in the past and may stay in place or be modified or replaced with new pragmatic approaches. Proponents of the municipal and occupational systems both value equity as they debate the synergy, redundancy, and important (if, by US standards, minor) inequities of programs that together serve the entire population. As in most of Europe, political discussions now include more prominently, proposals for limited market activity in the health sector, although market considerations have not, nor are they expected to determine the extent or distribution of most resources in the health sector. Finland's population continues to express a high degree of satisfaction with the arrangements as well as with the proportion of public revenue currently invested.[150]

In Finland, national effort has been devoted to integrating health, education, and economic policies to accomplish shared goals, such as employment for aging workers, whom government publications characterize as "a resource which society does not know how to utilize fully."[151] Finland's careful attention to worker health as a national asset and the concerted effort to emphasize the role of health across sectors has helped them cope with crisis and gain a more prominent role among Europe's industrial democracies. Finland held the Presidency of the EU at the time of our visit.

Conclusion

In our short but intense study tour of Finland, especially during the meals, evenings, and long car and boat trips that punctuated the prearranged program, we explored our hosts' formative experiences. We came to understand how they have refined their thinking about protecting and improving health as an aspect of building post-war Finland. As society builders, they helped create, by 1990, a stable and prosperous industrial democracy. We found they shared a commonality in thinking about how Finland had responded to the stunning jolt to their economy a decade ago and about the challenges that lie ahead. For the next generation of Finns, they possess an impressive intellectual legacy. That legacy helped us understand health as integral to growth and sustenance of society.

After months of reflection, we find ourselves drawing on their intellectual legacy in reconsidering health reform for the United States. The central insight, that Dr. Wickstrom helped us appreciate with his guidance and continuing correspondence, is that Finland's people consider health to be a special asset. Society functions to protect and enhance the health asset—by actions within the health sector and by integration of health, and health activities, into policy for other sectors of the society. We observed in operation the principles we named—*systematic, inclusive and equitable*—and have illustrated them in the examples presented above.

Our hosts' repeatedly demonstrated how their understanding of Finland's health history is rooted in epidemiology. They share a conviction that health problems, are best understood as community problems with cultural dimensions (diet, smoking, ergonomics, building design, air quality, the organization and changing skill demands of work). Solutions need to be understood similarly. Individual behavior is always a component of health, but unlike the US, the leaders we interviewed never seemed to view individuals as the principal target of preventive strategies or even of 'health promotion'.

If, as many now suggest, the long-enduring US health crisis can best be resolved by *rebuilding* our entire health sector, then Finland's experience is certainly relevant. Can we switch to a rebuilding mode? The United States has repeatedly attempted reform, often piecemeal, while honing criticism of omnipresent outrages. This is not to say that change cannot be incremental or that the piecemeal efforts are unimportant. There have been many significant steps forward, examples include health insurance portability, drinking water standards, Medicaid expansions for children, prepaid group practice, quality assurance systems, worker protection laws, and prevention of medical errors.

But Finland's experience cautions us that rebuilding to enhance the *health asset* depends on *linked* efforts informed by population data and research to protect, prevent, and treat, plus integration of health policies and activities with those of other sectors. Every health effort seems to be tied-in to society by a small number of operating principles and a common base of data for constructing a national self-portrait. Operating principles appear to guide tasks and provide a yardstick against which to assess progress and redirect efforts.

We, in the United States, must rebuild from a different starting place. Experts in public opinion report that Americans consider health a "second level priority" and only accord it primacy from time to time.[152] There is little evidence that US political leaders conceive of health as a national asset or articulate its role as such. Perhaps those of us engaged in health reform can propel rebuilding in two ways:

- Help those who aspire to be tomorrow's leaders, learn the potential value to American society of treating our population's health as an asset; and

- Identify and articulate a few operating principles to serve as guideposts for rebuilding our health sector.

With more thought we may identify operating principles uniquely appropriate to the US. They may or may not sound like those we have characterized from Finland's programs and literature. But if we cannot articulate some uniquely suited to our situation, those adopted by Finland at the start of modernization still have a certain logic and appeal. Perhaps we can move beyond evidence-based medicine and on to evidence-based health.

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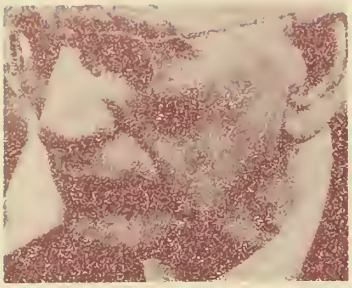

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